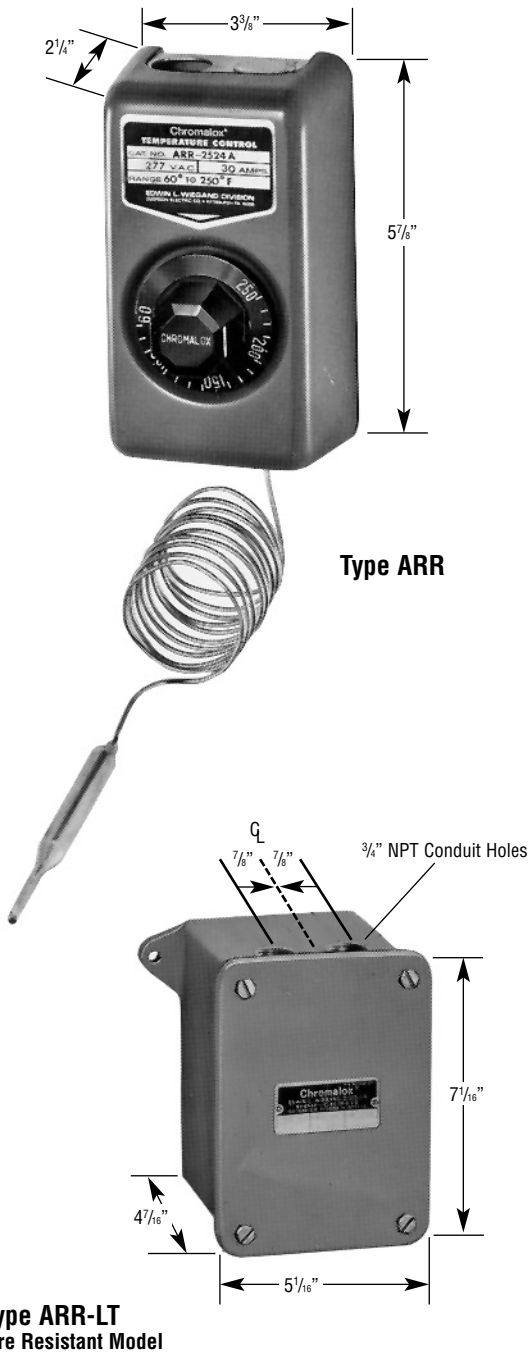


Chromalox®

Installation, Operation and RENEWAL PARTS IDENTIFICATION

SERVICE REFERENCE	
DIVISION 4	SECTION ARR
SALES REFERENCE (Supersedes PK425-1)	PK425-2
161-562792-001	
DATE	JANUARY, 1988

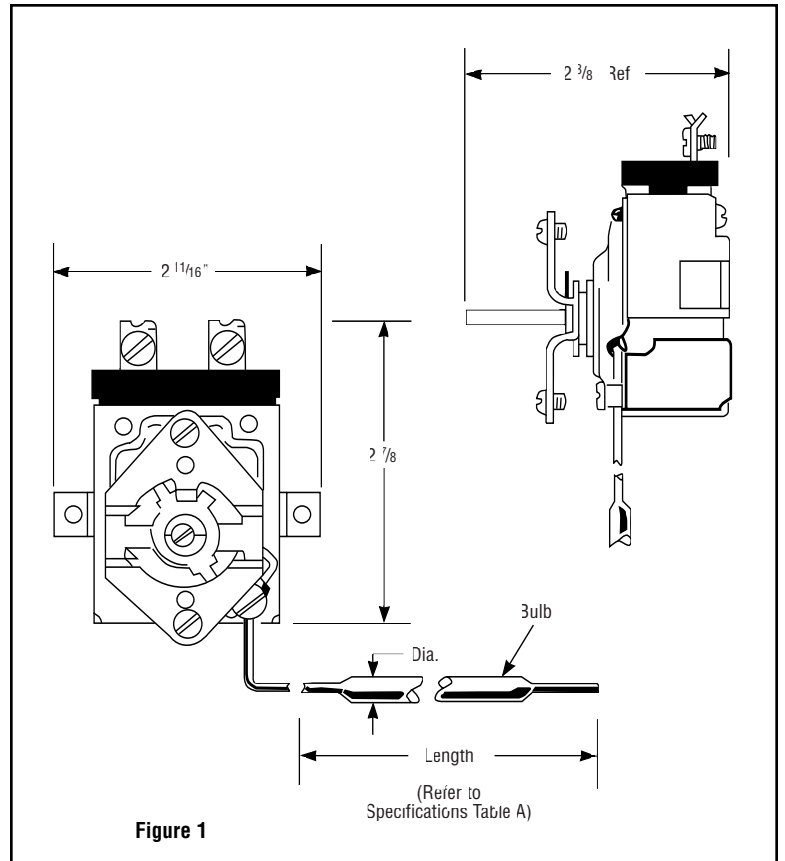
Type ARR Inverse-Action Thermostat



Specifications – Table A

Model	Temperature Range (°F)	Sensing Bulb with 7' Standard Capillary			Max. A.C. Rating (Amps)
		Style	Dia. (In.)	Approx. Length (In.)	
ARR-215	60-250	5	3/8	4 1/4	30 Amp 120-277 Vac (1 Pole Res.)
ARR-219	60-250	9	3/16	16 9/32	
ARR-515	200-550	5	3/8	3 1/4	18 FLA-72LRA 250 Vac
ARR-519	200-550	9	3/16	11 1/4	125 Vac 120-277 Vac (Pilot Duty)

Models installed in a moisture-resistant enclosure are designated by the suffix "LT" on the model number.



GENERAL

NOTICE: Type ARR Thermostats are designed for temperature control service only. Because they do not fail safe, they should not be used for temperature limiting duty.

CAUTION: Users should install adequate back-up controls and safety devices with their electric heating equipment. Where the consequences of failure may be severe, back-up controls are essential. Although the safety of the installation is the responsibility of the user, Chromalox will be glad to make equipment recommendations.

Principle of Operation — Control action of these thermostats is provided through the principle of liquid volume change. With a variation in temperature, the liquid in the sensing bulb expands or contracts, causing a bellows to actuate the switching mechanism.

Note: In Inverse-Action Thermostats, contacts close on temperature rise.
Housing — The control housing and cover assembly is of heavy-gage sheet metal on NEMA-I models. Moisture resistant (LT) models have housing and cover assembly made of heavy gage cast aluminum.

Power Supply — **WARNING: Use on AC only. Thermostat is not DC rated.**

Control Range — The following temperature ranges are available:
Fahrenheit

60 to 250 200 to 550

Note: This control does not have an "OFF" position.

Process Temperature Differential — May be minimized by:

1. Make sure control is mounted to vertical surface. (See Step 1, MOUNTING section)
2. Avoid excess cooling capacity.
3. Locate control sensing bulb in optimum position between cooling source and work.

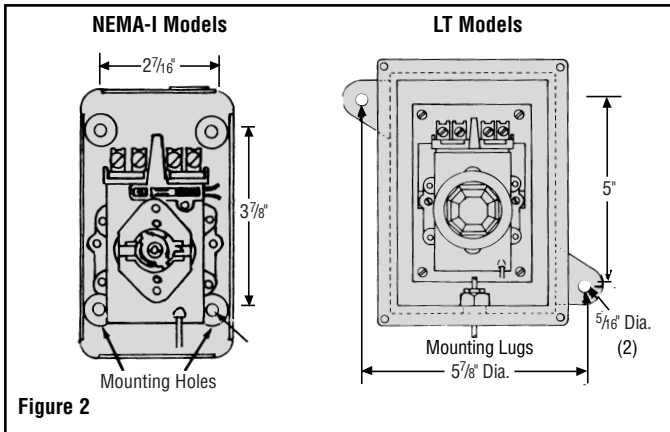
Packing Glands — If a sealed or leak-proof connection is required at the point where the capillary enters the oven, tank, pipe or similar equipment, an appropriate packing gland is available as an optional part. (Models CCF-25A, CCF-25D or CCF-25E)

CAUTION: Not for use in hazardous environments as described in National Electrical Code. Failure to comply can result in explosion or fire.

MOUNTING

Note: Do not mount control where it will be subject to vibration, shock, grease, dust, lint or corrosive vapors. Do not mount adjacent to a large magnetic contactor, as vibration and shock will cause thermostat to interact erratically — resulting in chattering of the contactor.

The air temperature in and around the control enclosure should be kept as near to normal room temperature as possible... **never** above 150°F.



4. CAUTION —

- A. Bending or deforming sensing bulb will alter control calibration — requiring recalibration after installation. See CALIBRATION section, page 3. If necessary, Style 9 bulbs can be coiled to 1" I.D. (See Figure 3.)
- B. Do not kink capillary tube. The resulting constrictions in fluid flow can destroy control function or broaden temperature differential. Minimum capillary tube bending diameter is 1/2" I.D. (See Figure 4)

Figure 3
(Sensing Bulb)

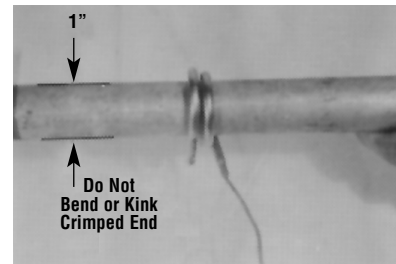
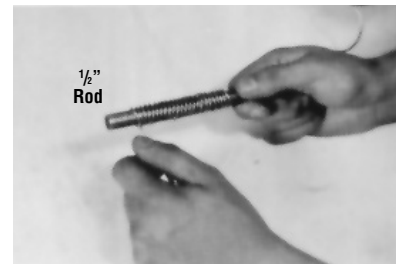


Figure 4
(Capillary Tube)



1. Thermostat must be mounted in a vertical position only.
2. Use sheet metal or wood screws through the mounting holes in baseplate to mount control. (See Figure 2)
3. For controlling platen or die temperatures, insert entire sensing bulb into drilled holes selected for snug slip fit.

The longer, more sensitive Style 9 bulbs should be used for controlling air temperatures or pipe line heating.

Note: If material in contact with bulb or capillary is corrosive, a protective well should be used. Protective wells are available as an optional part. Check Factory.

- C. Any deformations of bulb or capillary that result in leakage of fluid from control renders control inoperative.
- D. Avoid passing control capillary tube through zones whose temperature is in excess of controlled process temperature. Erratic control or destruction of control function may result.

WIRING

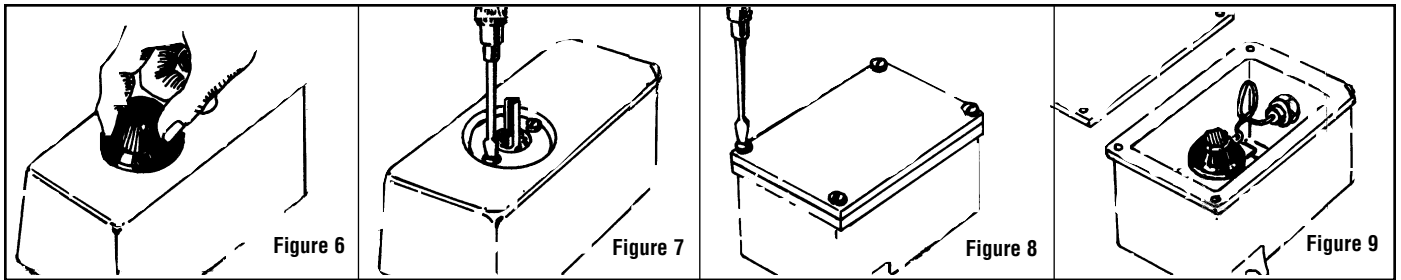
CAUTION: Hazard of Electrical Shock. Disconnect all power before wiring or servicing this control. Failure to comply can result in electrical shock or electrocution.

1. Electric wiring to heater must be installed in accordance with local and National Electrical Codes. **WARNING: Use copper conductors only.**

NEMA I Models:

- A. Entrance for wiring is provided by two 1/2" conduit holes in end of base plate.
- B. Remove knob by lifting knob from shaft. (See Figure 6)
- C. Removal of the knob will reveal two mounting screws positioned under the knob. Remove screws and lift off cover. (See Figure 7).

WIRING



LT Models:

- A. Entrance for wiring is provided by two $\frac{3}{4}$ " NPT conduit holes in end of housing. Wiring to control housing should be in moisture-resistant conduit.
 - B. Remove cover by removing four hexhead screwbolts. (See Figure 8 and 9)
2. Connect wires according to wiring diagrams (Figures 10 and

- 11). **Note:** Electrical connections should be made with generous loops of wire — approximately 6" per lead.
3. Replace cover and tighten screws.
4. Replace dial knob. (NEMA-I models only).
5. **Note:** If load amperage or voltage rating exceeds switch rating, a contactor must be used. (See Figure 11) Contactors are available as an optional part.

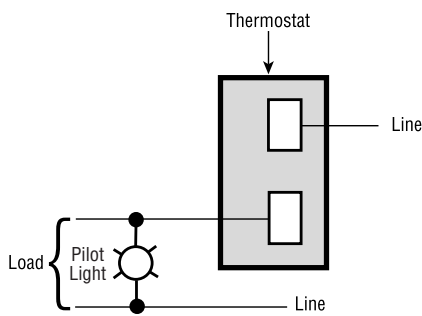


Figure 10 — Single phase loads when load does not exceed rating of thermostat.

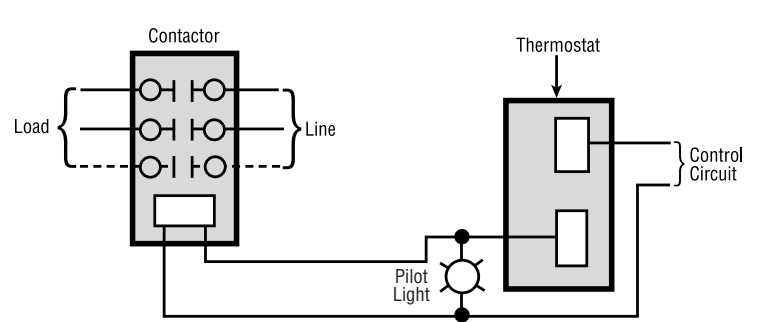


Figure 11 — Single phase loads when load exceeds rating of thermostat and three phase loads.

CALIBRATION

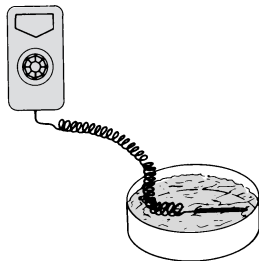


Figure 12

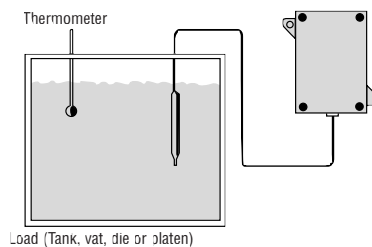


Figure 13

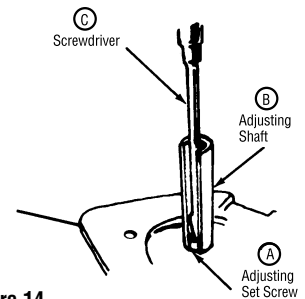


Figure 14

CAUTION: Hazard of Electric Shock. Extreme care should be exercised during calibration adjustments because of shock hazard due to exposed electrical terminals.

These controls are factory calibrated to the range indicated on the control adjustment knob.

If calibration is required either one of two methods may be followed:

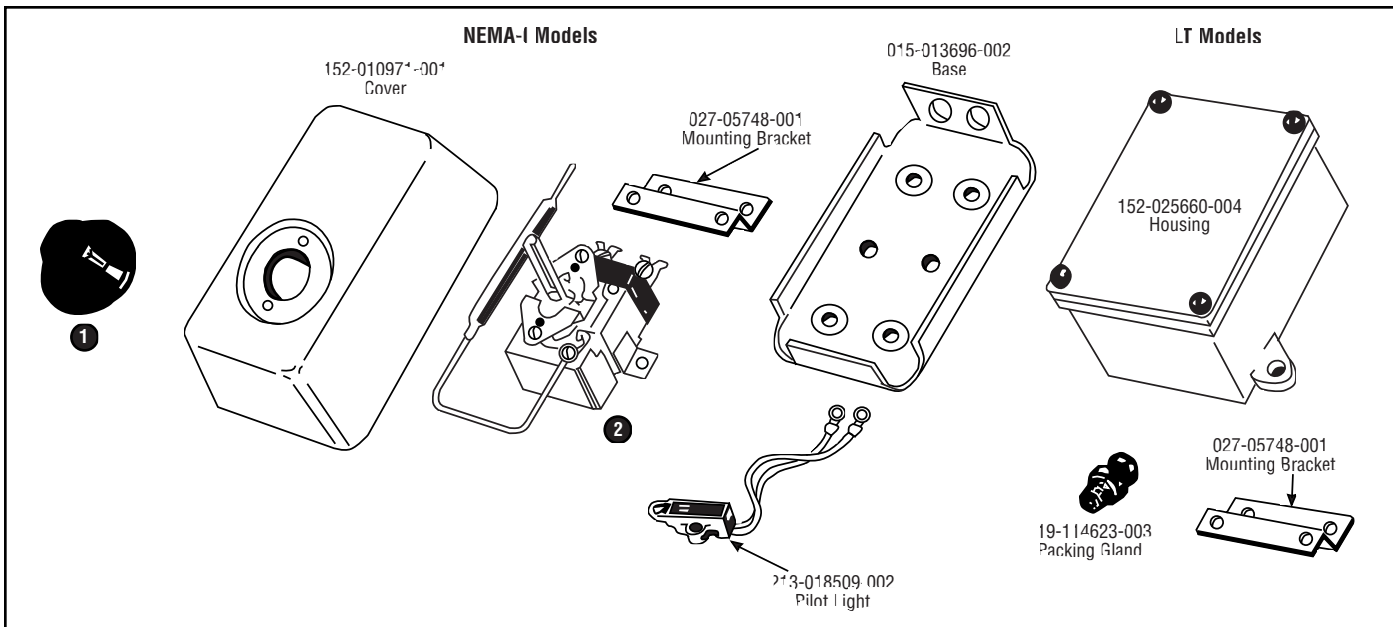
1. If accurate measurement standards are not available, the thermostat can readily be adjusted to a known temperature standard such as boiling water (212°F). (See Figure 12)
2. With the aid of an accurate thermometer or other temperature measuring device, recalibration may be performed within the process as in Figure 13.

For either method the following general calibration procedures should be followed.

1. Remove knob and thermostat housing as per instructions under WIRING.

2. Replace knob and turn to highest temperature setting.
3. Slowly turn knob and when controls click "off", compare the dial reading against the thermometer reading.
4. **If they do not agree —**
 - A. Set dial knob to thermometer temperature reading and pull off knob.
 - B. While holding the adjusting shaft (B) tightly, turn small center adjusting screw (A) with small screwdriver (C) until thermostat clicks "off". (See Figure 14)
Note: Always use extreme care not to damage the slot in the center adjusting screw.
 - C. Each quarter turn of the screw will change the calibration approximately 30°F:
 - Clockwise to decrease temperature
 - Counter clockwise to increase temperature
 - D. Recheck calibration and repeat process if closer calibration is required.

RENEWAL PARTS IDENTIFICATION



Model	① Dial Knob	② Thermostat Sub-Assembly
ARR-215	169-046036-001	300-057437-001
ARR-219	169-046036-001	300-057437-002
ARR-515	169-046036-002	300-057437-003
ARR-519	169-04636-002	300-057437-004

Limited Warranty:

Please refer to the Chromalox limited warranty applicable to this product at <http://www.chromalox.com/customer-service/policies/termsofsale.aspx>.

Chromalox®
PRECISION HEAT AND CONTROL

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